CORPORATE GOVERNMENTS: GOVERNMENT CONNECTIONS OF PUBLIC OIL AND GAS COMPANIES

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Abstract

It is well known that governments have direct control over much of the energy sector through National Oil Companies (NOCs). Much less understood are the determinants and consequences of government connections of their stock exchange listed counterparts, Public Oil & Gas Companies (POCs). This paper focuses on an important mechanism through which POCs and governments can influence one another: the presence of current and former government employees among POC directors. Specifically, we expect that current government officials serving on POC boards are more likely than other board members to be a channel through which governments influence firms. Former government officials on POC boards, on the other hand, are more likely than other board members to lobby their governments on the companies' behalf. We collect data on 112 large POCs from 35 countries, and on country and size-matched control firms outside the oil & gas sector. The empirical results provide partial support for our hypotheses. We find that the importance of the energy sector in a country's economy does not impact the government connectedness of its POC boards. Country-level corruption measures, on the other hand, are positively related to the prevalence of current and former government officials on POC boards' – and in the case of current officials, significantly more so than for non-energy firms. Lastly, there is some indication that having former government officials on a POC board contributes to the firm's profitability.

Keywords: Oil & Gas, Corporate Governance, Boards, Political Connections

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1. Introduction

Natural resources - oil & gas being the foremost of these - are a mixed blessing to countries that possess them. Despite their potential for improving a country's lot, they often generate a host of economic, political, and social problems known collectively as the resource curse. These problems are inextricably linked to institutions tasked with exploiting the resource on the government's behalf. In the case of arguably the most crucial resource of all, these institutions are the so-called National Oil Companies, or NOCs (the term is understood to include gas exploration as well). There is extensive research on the governance problems plaguing NOCs. A common underlying theme in this research is that NOCs should strive to be more like their more transparent and more profitable publicly listed counterparts, the Public Oil Companies (or POCs). Assumed to be largely independent of government interference, POCs are generally held as a model of governance that NOCs should strive toward, instead of being held back by their inherent links to the government. Yet to date, there has been no systematic investigation into POC-

government linkages and the role these play in the governance of POCs. This study aims to fill this gap.

Both POCs and governments stand to benefit from exercising influence over each other. In this study we focus on a key mechanism through which such influence can be exercised: current and past affiliations of POC board members. Specifically, we expect that current government officials serving on POC boards are more likely than other board members to be a channel through which governments influence firms. Former government officials on POC boards, on the other hand, are more likely than other board members to lobby their governments on the companies' behalf. This study examines the incidence, the determinants, and the effects of both types of affiliation.

More broadly, the purpose of this project is to generate empirical evidence on a key aspect of the modern economy where at present there has only been unexamined conventional wisdom. Neither analysts' assumptions that POCs are free of government interference, nor oft-heard public opinions that POCs 'play' the government are, to the best of our knowledge, based on systematic research. By filling

this gap, this paper advances public discourse about the functioning of a vital industry, and as such has the potential to influence policy-making with respect to the industry's future.

The remainder of the paper is organized as follows. Section 2 surveys related literature and the hypotheses it leads us to. Section 3 overviews the data. Section 4 presents the analytical methods used and the rationale for their use. Section 5 presents the empirical results, while Section 6 reports on robustness checks. Section 7 discusses how this empirical research fits the topic at hand, and how its limitations provide a direction for future investigation in this realm. Section 8 concludes.

2. Literature review and hypotheses

In the wake of environmental disasters caused by recent oil spills, attention to the corporate governance of oil & gas companies and the influence of governments on corporations has been increasing (Windsor and McNicholas 2011). More recently, Gazprom, in spite of having 50% of outside investors and being listed on the Moscow Stock Exchange, is widely seen as tool of Russian government policy in the Ukraine conflict (Soldatkin and Astakhova 2014), while Nasdaq-listed Petrobras has been accused of making unambiguously value-destroying decisions at the Brazilian government's behest ("Petrobras" 2014). Conversely, the media frequently expresses concern over oil & gas firms' employment of former government officials (Weston 2014; Gloystein 2014). To date, however, studies have either focused on the governance of NOCs, or the relationship between political connections and firms in general (Victor et al 2010). No systematic analysis of the oil & gas sector has been undertaken with respect to the relationship between political connections and publicly listed oil & gas companies – yet the oil & gas sector is, arguably, one in which politics and economics interact the most. 75% of all oil production and 90% of proven oil reserves in 2010 were controlled by NOCs and those POCs in which the government is a majority shareholder – and this figure is growing, illustrating a desire by national governments to be involved in that sector of the economy (Tordo 2011).

Despite the growing influence of NOCs, they are regularly riddled with governance and performance issues, often a reflection of the national government's problems. These problems are often deep-rooted and complex, but a prominent stream of literature in political economy has hypothesized that natural resources – and oil in particular – are an important source. This phenomenon is called the resource curse, and Ross (2001), among many others, produces evidence for the idea that oil weakens democracies and helps foster corruption. A solution that is commonly suggested to fight the spill-over of mismanagement and corruption into NOCs is to publicly list them, or at the very least to structure

them and run them as POCs. Doing so would force NOCs to publish their financials and other paperwork, and (in theory) expose any inefficiency in the company. Through shareholder pressure, these problems would be resolved. Lopez (2011) overviews the case of Petronas, which is broadly regarded as one of the best run oil & gas companies with majority government ownership, and a model for NOCs to follow. However, in interviewing senior management and executive board members of Petronas, Lopez finds that as Petronas' success grows, it is increasingly viewed by the corporation's political masters as a source of wealth to milk, and interventionism that runs counter to Petronas' interests as a corporation also grows. This implies, then, that Petronas' government-connectedness (henceforth GC) is worsening its governance and detracts from its goals as a company.

A number of cross-firm analyses find that there is indeed a negative correlation between GC and company value. Bertrand et al. (2007), in a study of French companies, find that as a company's government connectedness increases, so does its tendency to hire more and fire less around election years. It is important to note that how each paper defines government connectedness varies. In this instance, Bertrand et al. placed particular emphasis on whether the CEO alone is particularly government connected. Boubakri et al. (2008) also find that "politically-connected firms exhibit a poor accounting performance compared to their non-connected counterparts" in an analysis of 245 privatized firms across 41 countries over a period of time from 1980 to 2002. In their paper, government connectedness is defined as whether a board member is a current or former politician. For yet another definition of government connectedness, Fisman (2001) finds that "the returns of shares of politically dependent firms were considerably lower than the returns of less-dependent firms" in Indonesia.

While the above cited papers all find that politically-connected board members use their power in a company for political means, the reverse argument, that connections benefit companies, also has found compelling backing. Do et al. (2013) define GC as whether corporate directors were university classmates with politicians, and find that "connections to elected governors increase firm value by 1.36% on average surrounding the election date". Goldman et al. (2009) also show "positive abnormal stock return following the announcement of the nomination of a politically connected individual to the board" (ibid, p. 2331). Additional support for the idea that GC adds to company value is to be found in Wu et al.'s (2012) study of Chinese companies. Arguably the most prominent and data-rich paper on the subject, by Mara Faccio (2006), studied 20,202 companies spanning 47 countries, and found that "announcement of a new political connection results in a significant increase in value". In fact, the value of political connections has

been recognized by shareholders going as far back as the late Victorian period, according to Braggion and Moore (2013), who find a significant positive correlation between GC and company value for British firms of that period.

There are strong reasons to expect political connections to be of particular importance in the oil & gas industry. Agrawal and Knoeber (2001) find that, in the U.S., "politically experienced directors are more prevalent in firms where sales to government, exports, and lobbying are greater". In light of this, and given the fact that these characteristics are relatively strong in the oil & gas sector, one would expect to find more politically experienced directors in oil company boards. This may be because politically experienced directors provide a benefit to the company, as they are well aware of the country's procedures and potentially have ties to key decision-makers. Alternatively, it may be that companies are coerced by governments into hiring such directors.

There is significant value to understanding how POCs function. In general, the extractive process that many oil & gas companies are involved in seems to lead to negative development outcomes (Carbonnier et al. 2011). As previously mentioned, the argument that taking a company public will introduce it to a series of checks and balances is oft-repeated, and many sources support the idea that "the presence of effective checks and balances seem to be critical to reverse the negative development outcome of extraction" (ibid). This places the oil & gas industry in a rather special position to foment positive development (Carbonnier and Jerbi 2013), and shedding light on the effect and presence of political connections in POCs could help pave the way for appropriate policy responses.

Yet despite the research on NOCs and their governance on the one hand, and research on the role political connections play in corporate governance on the other, the role of political connections in POCs has eluded investigators thus far. Equally neglected has been the question: who is playing whom? Are oil & gas firms using governments, or are governments using oil & gas firms? This is the lacuna our project seeks to address, by focusing on a key mechanism of bi-directional influence between governments and firms – the loyalties of the directors on company boards.

We formulate our first hypothesis (H1) based on the following rationale: If current government employees are tools of governmental control over companies, then they are likelier to be present in countries where this type of influence is easier to conduct; This governmental involvement would also be likelier in countries where the oil & gas sector plays a more important role in the national economy, and would detract from the company's goals in favor of more political ends. This leads us to the following (sub) hypotheses:

H1.A: If corruption is more prevalent in a country, then the board will have more members who are government employees.

H1.B: If the importance of the oil sector is greater within a certain country, then the board will have more members who are government employees.

H1.C: If the stake of the government in a POC is higher, then the board will have more members who are government employees.

H1.D: If a POC's board has more current government employees on it, then the efficiency and profitability of the company in question will decrease.

The rationale behind our second hypothesis (H2) is as follows. The mechanism posited in this paper argues that the hiring of individuals previously employed by government is a method of corporate influence on governments – an influence that is also conceivably more powerful in countries where corruption is the norm. Since the purported aim of this influence is to benefit the oil & gas firm, one would expect for the hiring of past government officials to result in greater efficiency and benefits vis-à-vis government, perhaps (but not necessarily, given this is a rather strong effect – a type of regulatory capture) through lowered tax rates. Additionally, a positive relationship between the size of the company and its government connectedness through past officials could also be expected – if it is indeed the case that these officials provide larger-than-usual benefits to companies – since larger companies can afford them, and are also more prestigious and thus attractive to the officials themselves. The resulting (sub) hypotheses can be phrased as follows:

H2.A: If corruption is more prevalent in a certain country, then the number of directors previously employed by government will increase.

H2.B: If the number of former government employees on a company board increases, then the company will be more efficient and profitable.

H2.C: If the number of former government employees on a company board increases, then the company will exhibit lower tax rates due to regulatory capture.

H2.D: If the POC is larger, then it is likelier that the board will be made up of former government officials.

Appendix B lists the variables used to capture the concepts involved in these hypotheses, and Appendix C visually summarizes the hypotheses themselves. Appendix D lists the expected relationship between the variables expounded in Appendix B with government connectedness in oil & gas firms. The next section discusses what data we use and how it was collected.

3. Data

To create our sample, we first identify publicly-listed companies in the oil & gas sector with a market capitalization in excess of GBP 1 billion at the start of

February 2014. In order to do this, we use the Financial Times' market screener. This results in 206 firms from 35 countries. In order to have a sample that is balanced internationally, we select no more than the ten largest POCs from each country. Additionally, in instances where BoardEx data is unavailable and no reliable alternative source on board composition can be found, observations are removed. The above mostly affects the US, the UK, and Canada and reduces our sample to 113 firms. For each POC we then select a control firm that is domiciled in the same country, is outside of the oil & gas sector, and is closest in market capitalization to the sample firm. As Gabon has no listed companies that could serve as a control for Total Gabon S.A., this firm is dropped from the sample. Our final sample therefore contains 112 firms from 34 different countries, with 20 countries contributing two or more firms. Specifically, ten firms each are contributed by Canada, Japan, and the US; nine by the UK; eight by China and Russia; six by Australia and India; four by France and Thailand; three by Chile, Italy, and South Korea; two by Brazil, Israel, Malaysia, Norway, Pakistan, Philippines, and Poland; and one firm each by Argentina, Austria, Colombia, Finland, Greece, Hungary, Ireland, Netherlands, Portugal, Romania,

Spain, Sweden, Turkey and the United Arab Emirates. Thus our sample contains firms from a wide variety of economic, political, and corporate governance environments.

To help account for country-level effects, we also collect data on control companies. These are non-oil & gas companies with market capitalizations as close as possible to those of the sample firms (on February 6th 2014), and within the same country as the oil & gas companies. We thus also have 112 control firms from 34 different countries, which we use later for data analysis to help determine the significance of any differences between sample and control firms.

With this done, we then use BoardEx to review the employment history of every member of the board of directors for both the sample firms and the control firms, and code each board member (with CEOs coded separately) as either 'never employed by government', 'currently employed by government', or 'previously employed by government'. Finally, we use Thomson ONE Banker to collect data on the effective tax rate and return on assets of sample and control firms, and FactSet to collect data on their government ownership.

Table 1. Descriptive statistics

This table presents summary data on sample and control firms. The sample consists of publicly listed oil & gas companies with market capitalization in excess of GBP 1 billion as of end-January 2014. For each sample firm, a control firm outside the oil & gas sector is chosen that is domiciled in the same country and has the closest market capitalization to that of the sample firm.

	Sample firms			Control firms			Test for equality of means		
Variable	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Diff-ce	T-stat	P-value
Market capitalization (GBP billion)	15.9	6.44	25.6	13.5	5.7	21.5	2.34	3.16	0.002
Board size	11.4	11	3.54	12.5	11	5.17	-1.08	-1.91	0.058
Proportion of the board with									
past government connections	22.4%	21.4%	15.2%	16.2%	12.5%	15.5%	6.2%	2.11	0.037
current government connections	6.3%	0%	12.9%	0.26%	0%	0.14%	6.0%	3.44	<0.001
past or current government connections	28.7%	26.6%	20.6%	16.4%	12.9%	15.9%	12.2%	6.05	<0.001
CEO with									
past government connections	11.6%	0%	32.2%	10.7%	0%	31.1%	0.9%	0.21	0.828
current government connections	3.6%	0%	18.6%	1.8%	0%	13.3%	1.8%	0.81	0.416
past or current government connections	15.2%	0%	36.0%	12.5%	0%	33.2%	2.7%	0.59	0.550

Table 1 shows the distribution of the key variables in our sample. The average market capitalization of the firms is, by construction, large: £15.9 billion (and heavily skewed: the median market capitalization is £6.4 billion). Although the applied procedure for identifying control firms looks for the nearest market capitalization company in each country, control firms tend to be slightly smaller:

£13.5 billion on average, with the median being £5.7 billion. This is not surprising, as a number of companies in our sample are the largest listed company in their country. This does not invalidate the control sample, however, as its main purpose is to control for country-specific variation in government connectedness.

The median board size for both sample and control firms are 11, which is typical for a large company's board. On average, however, control firms' boards are somewhat larger, with 12.4 directors as compared to 11.4 for sample firms (p-value = 0.058). Further, with control firms being more heterogeneous in terms of their sector representation, it is unsurprising that they have a pronouncedly higher standard deviation of board size than do sample firms (5.17 vs. 3.54). Nonetheless, having boards of comparable size for sample and control firms is helpful for interpreting our main results, which are concerned with the proportion of board members who are government connected.

The proportion of board members (including the CEO) who were previously government employed is 22.4% on average for oil & gas firms, which is significantly higher (p-value = 0.037) than the corresponding 16.2% for controls. For current employment, the difference is even more striking: 6.3% for energy firms and only 0.3% for others (p-value < 0.001). For past and current employment combined, therefore, the difference is especially pronounced: while 16.4% of control firms' directors on average (median, 12.9%) are past or current government officials, such government connections are roughly twice as common among oil & gas firms: the average is 28.7% (median, 26.6%).

When we look specifically at CEOs' connectedness, around one in ten worked for the government in the past in the case of both sample and control firms. Interestingly, 3.6% of oil & gas CEOs are being employed by the government concurrently with running the firm. None of the matching firms in the other industries are headed by a government employee.

While there is anecdotal support for the notion of especially close links between corporate boards and governments in the case of oil & gas firms, to the best of our knowledge the above results are the first to document this pattern internationally. Figure 1 further illustrates this by showing, for each country in the sample, the average level of total connectedness (through past and present employment) of each country's oil & gas firms, as compared to matching firms. It can be seen that for all but eight countries (Austria, Canada, Chile, Greece, South Korea, Spain, Turkey and UAE), the oil & gas sector is more government connected than are other comparable firms.

The difference in connectedness, however, is unlikely to be explained by country-specific factors alone, as is illustrated by Figure 2. This figure, for countries with at least two oil & gas industry members, shows the highest and lowest proportions of government connectedness. It is easy to see that national variation is very high as compared to cross-country variation.

Lastly, Figure 3 provides a visual representation of the sample at the individual firm level, by plotting total connectedness against log-market capitalization. There is no obvious pattern linking firm size and its connectedness. Additionally, we mark in black companies whose CEOs are concurrently serving as government officials, and in gray, companies whose CEOs did so previously. Once again, there is neither clear pattern between CEO connectedness and overall board connectedness, nor even between CEO connectedness and firm size. Multivariate analyses, explained in the next section, allows us to disentangle formally the different country and company characteristics' effect on board connections through past and present employment.

Figure 1. Government connectedness of oil & gas firms vs that of control firms
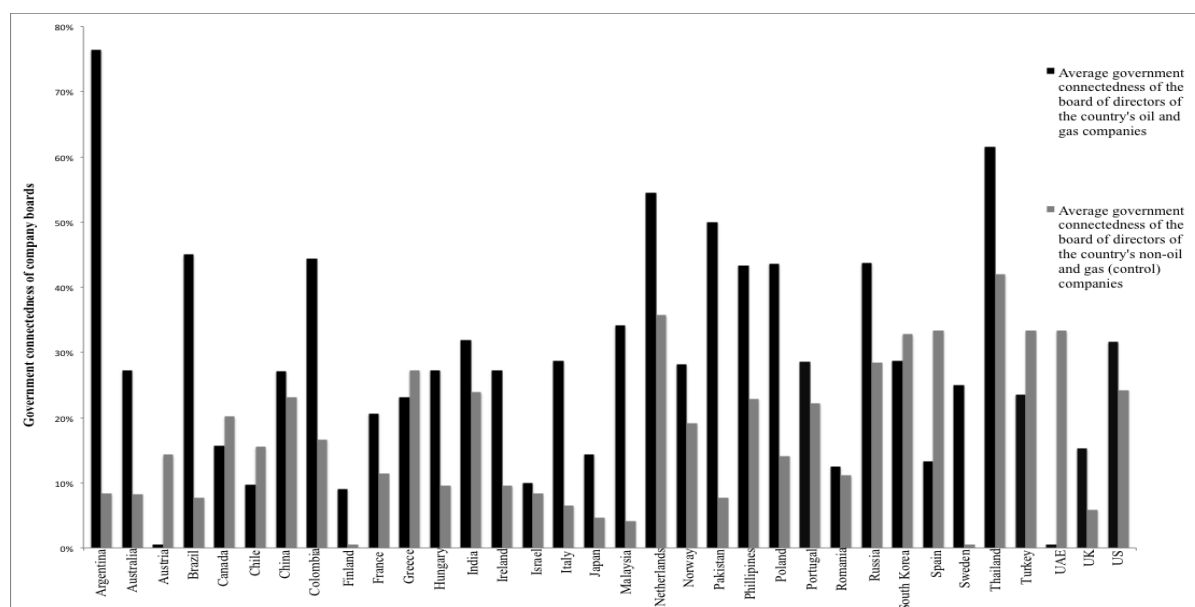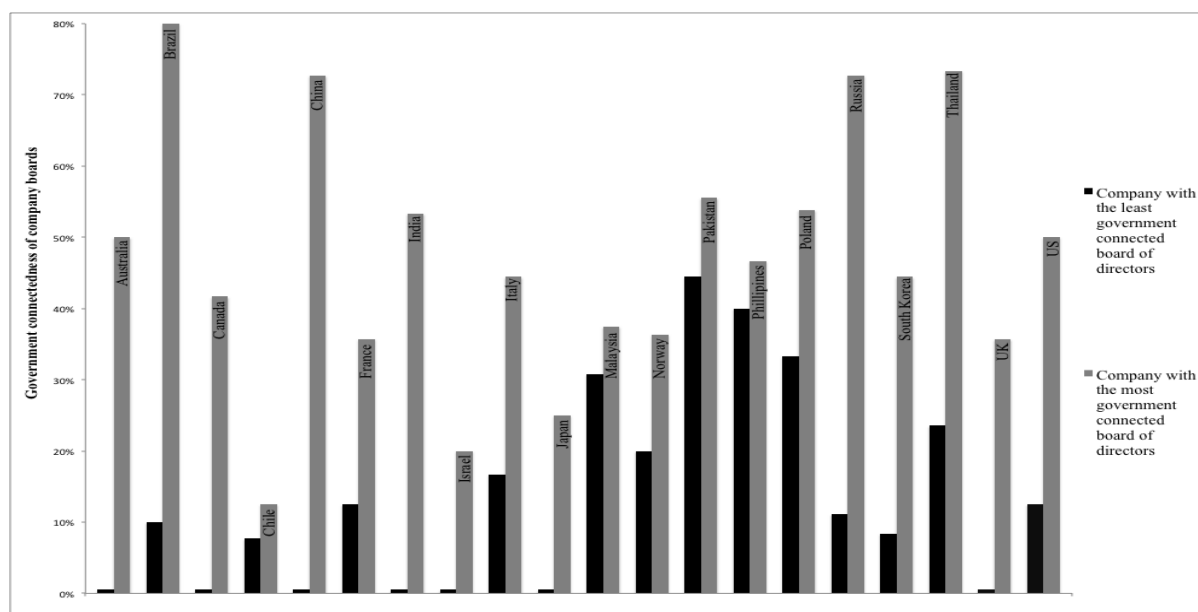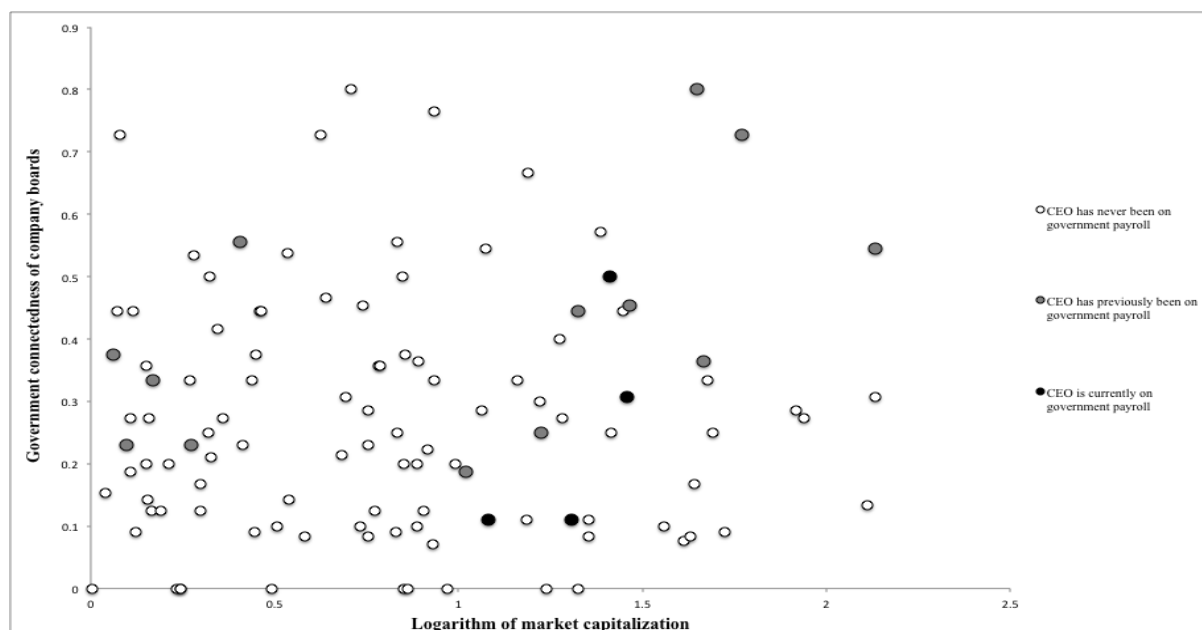
Figure 2. Highest and lowest government connectedness of oil & gas company boards, by country

Figure 3. Government connectedness vs. logarithm of market capitalization in oil & gas companies

4. Methodology

As the workhorse model throughout the analyses, we use OLS regression, with the share of board seats occupied by government connected individuals as the dependent or an independent variable, depending on the hypothesis being tested.

Given that the chosen unit of observation is a single company but groups of companies can be domiciled in the same country, a more appropriate modeling strategy for this study would be multi-level regression. Note, however, that coefficient estimates under multi-level regression would be identical to those of an OLS model anyway if there is no interaction effect recorded between the various levels. Including country clustering, for example, would preserve the estimated coefficients but could increase or decrease the standard errors depending on intra-cluster correlations. Since we only have around three companies per country on average, the multi-level nature of our sample is not an overwhelming concern, making the single-level approach a reasonable one.

Using the fraction of board seats occupied by government-connected individuals as the dependent variable makes it a limited dependent variable in the [0,1] range, which would endow OLS estimates with poor statistical properties. We therefore follow common practice (see e.g. Besley and Preston, 2007)

and replace such variables with their logistic transformation.

We note, though, that the logistic transformation cannot handle 0 and 1 values of the original variable. While we do not have any boards that are fully government connected, we do have a number that have no connections at all, which requires an ad-hoc decision about truncating these variables. A standard practice to deal with this is to replace 0 values with small positive numbers – in our case, 0.05 (using values of 0.01 or 0.1 for instance does not affect our results). Another way to approach this is to employ so-called fractional logistic regression, which can handle both fully government connected and fully disconnected boards. We report on the results of such regression in Section 6.

Lastly, we use the logarithm of market capitalization as a proxy for firm size. This modeling choice is common in the finance literature (including in such influential papers as Fama and French, 1992) due to the highly skewed nature of market capitalizations. For instance, Figure 3 would look very different if the market capitalization were not logged: there would be a very dense cluster of firms around the 1-10 billion GBP mark where the majority of observations would lie, with a smattering of firms around 80 billion GDP – scaling the graph in a way that would make it more sparse and rather less informative as a result.

4. Results

Table 2. Determinants of companies' government connectedness through current employment

This table summarizes OLS regressions of boards' government connectedness for public oil & gas companies (Panel A) and for market capitalization-matched control firms outside of the oil & gas industry (Panel B). Government connectedness (GC) is the proportion of board members who are concurrently employed by the government, and the dependent variable is its log-odds ratio transformation: $\log(GC/(1-GC))$. Variables descriptions are contained in Appendix B. Coefficient estimates are followed by their p-values. Statistical significance at the 5 percent and 1 percent levels is market with * and **, respectively.

Panel A. Oil & gas firms

	(1)			(2)			(3)			(4)			(5)		
INTERCEPT	0.025	0.39		0.027	0.37		0.058	0.20		0.072	0.02	*	0.073	0.03	*
Oil Rent % GDP	0.320	0.42											-0.014	0.97	
Fuel % Merch. Exp.				0.011	0.88										
Fuel % Merch. Imp.							-0.013	0.40							
Control of Corruption										-0.044	0.00	**	-0.044	0.01	**
Govt Ownership	0.218	0.00	**	0.226	0.00	**	0.235	0.00	**	0.154	0.03	*	0.154	0.03	*
Log of Market Cap	0.013	0.28		0.015	0.24		0.013	0.32		0.015	0.21		0.015	0.22	
Adjusted R-squared	0.095			0.090			0.096			0.156			0.132		
N	112			112			112			112			112		

Panel B. Control firms

	(1)			(2)			(3)			(4)			(5)		
INTERCEPT	0.030	0.02	*	0.031	0.02	*	0.019	0.36		0.032	0.03	*	0.034	0.02	*
Oil Rent % GDP	-0.055	0.76											-0.084	0.65	
Fuel % Merch. Exp.				-0.010	0.77										
Fuel % Merch. Imp.							0.046	0.51							
Control of Corruption										-0.003	0.65		-0.004	0.58	
Govt Ownership	0.106	0.04	*	0.105	0.03	*	0.107	0.03	*	0.093	0.07		0.097	0.06	
Log of Market Cap	-0.002	0.66		-0.003	0.66		-0.002	0.73		-0.002	0.62		-0.002	0.69	
Adjusted R-squared	0.020			0.020			0.023			0.021			0.014		
N	112			112			112			112			112		

Table 2, Panel A shows the results of regressions where the logistic transformation of government connectedness through current government employment is regressed on the panel of variables enumerated above for our sample of public energy firms. Model (1) regresses current connections on oil rent and the result is insignificant (p-value=0.68). This result goes against the expectation that the economy's dependence on oil leads to interventionism whereby the government places its cronies on boards

of listed oil & gas firms. It is possible, however, that this is due to the specific proxy capturing oil dependence. In Model (2), therefore, we use fuel exports as percentage of merchandise exports as the explanatory variable. It, too, is insignificant. Since an economy's dependence on the oil sector could be due to the demand side rather than the supply side, in Model (3) we use fuel as percentage of merchandise imports as the explanatory variable. It is likewise far from statistical significance. In unreported results, we construct several additional versions of a proxy for oil dependence. The sum of imports and exports captures the size of fuel-related trade. The difference between exports and imports is the net fuel demand. The absolute value of the above difference captures net oil dependence. None of these variables is significant. In short, a country's dependence on oil, however it is defined, does not appear to be related to its intervention with public oil companies via pressuring them to accept government officials as board members.

Model (4) uses control of corruption to explain government official membership on listed energy company boards. This variable is highly significant (p-value=0.004) in the expected direction: the better a country is at controlling corruption, the fewer oil & gas company board members work for the government. This result has not, to the best of our knowledge, been demonstrated empirically on a broad international sample. We stress that control of corruption is highly (positively – but only because the 'control of corruption' score from the WGI decreases the better the situation is) correlated with country-level variables such as regulation quality and government effectiveness -- all of which are also

highly significant (results not reported for brevity but available upon request). The key takeaway from this is that poor national governance leads to meddling in (oil & gas firms') corporate governance.

The final regression, Model (5), includes both oil rent and control of corruption in the regression, but the earlier results are confirmed: oil rent is insignificant, but control of corruption is highly so (p-value = 0.01).

It is worth noting that government ownership is highly significant, as would be expected: the higher the government's ownership of a firm, the greater its ability to place officials on the company's board. Firm size, on the other hand, is insignificant, consistently with Figure 3, where there is no discernible pattern connecting the two variables.

To determine whether this is endemic to the oil & gas industry, in Panel B of Table 2 we conduct the same regressions for our size-matched control sample of non-oil & gas firms. As would be expected for such firms, oil dependence does not influence their board composition (Models 1-3). Interestingly, control of corruption and related good national governance proxies are also unimportant (Model 4). While control of corruption is a significant predictor of board composition for our sample firms but not for our control firms, it is possible that the difference between its predictive power for the two samples is not significant. However, when we conduct a formal test for difference of coefficients, we find the p-value to be highly significant (0.019 for Model 4, and 0.022 for Model 5). This is consistent with the notion that corrupt states have a pecking order of industries to meddle with: the strategically important oil & gas sector comes first.

Table 3. Determinants of companies' government connectedness through past employment

This table summarizes OLS regressions of boards' government connectedness for public oil & gas companies (Panel A) and for market capitalization-matched control firms outside of the oil & gas industry (Panel B). Government connectedness (GC) is the proportion of board members who were employed by the government in the past, and the dependent variable is its log-odds ratio transformation: $\log(GC/(1-GC))$. Variable descriptions are contained in Appendix B. Coefficient estimates are followed by their p-values. Statistical significance at the 5 percent and 1 percent levels is market with * and **, respectively.

Panel A. Oil & gas firms

	(1)			(2)			(3)			(4)			(5)		
INTERCEPT	0.113	0.01	**	0.119	0.00	**	0.088	0.15		0.178	0.00	**	0.185	0.00	**
Oil Rent % GDP	0.219	0.68											-0.285	0.59	
Fuel % Merch. Exp.				-0.031	0.76										
Fuel % Merch. Imp.							0.122	0.56							
Control of Corruption										-0.064	0.00	**	-0.067	0.00	**
Govt Ownership	0.067	0.46		0.077	0.40		0.066	0.46		-0.030	0.74		-0.028	0.76	
Log of Market Cap	0.081	0.00	**	0.083	0.00	**	0.084	0.00	**	0.082	0.00	**	0.084	0.00	**
Adjusted R-squared	0.171			0.170			0.172			0.239			0.234		
N	112			112			112			112			112		

Panel B: Control firms

	(1)			(2)			(3)			(4)			(5)		
INTERCEPT	0.078	0.06		0.077	0.07		0.088	0.18		0.132	0.00	**	0.129	0.01	**
Oil Rent % GDP	0.565	0.31											0.206	0.72	
Fuel % Merch. Exp.				0.058	0.59										
Fuel % Merch. Imp.							-0.021	0.92							
Control of Corruption										-0.054	0.01	*	-0.052	0.02	*
Govt Ownership	0.164	0.29		0.190	0.22		0.208	0.17		0.069	0.66		0.057	0.72	
Log of Market Cap	0.057	0.00	**	0.059	0.00	**	0.060	0.00	**	0.061	0.00	**	0.060	0.00	**
Adjusted R-squared	0.086			0.080			0.077			0.130			0.123		
N	112			112			112			112			112		

While the previous set of results focused on government involvement in corporate boards, we now turn to the determinants of corporate reliance on former government officials as directors. Although it is entirely possible that such individuals are selected purely for their ability, it is also plausible that their government connections also play a role – especially given the greater overall connectedness of the oil & gas industry vis-à-vis others. (As we discuss in Section 7, in future work, it could be interesting to flag separately directors with prior experience in the oil & gas industry.) The structure of Table 3 parallels that of Table 2, the only difference being that the dependent variable captures boards' government-connectedness through past rather than current employment.

Models 1-3 of Panel A assess the influence of the country's oil dependence on its oil & gas firms' government connectedness. None of the variables used to proxy for oil dependence – oil rent, fuel exports, fuel imports -- are close to statistical significance. As in the case of Table 2, in unreported results we also used the sum of imports and exports, their difference, and the absolute value of their difference to capture fuel-related trade, net fuel demand and the absolute value of net fuel demand, respectively. None of these variables are significant. In other words, the extent to which oil & gas firms rely on former government officials for their boards is unrelated to these countries' oil dependence.

Model 4 uses control of corruption to explain government connectedness. we find that the worse a country is at controlling corruption, the more past officials sit on its oil & gas company boards (coefficient estimate = -0.0642, p-value = 0.002). This is as one would expect, since oil & gas firms (like other firms) stand to benefit from corruption by having government access through former officials. This result continues to hold after including oil rent in Model 5.

With regard to our control variables, while government ownership predicts government connections through current employment, it is unrelated to past employment. This is consistent with our conjecture that the government is likely to use its stake to enter the company board, whereas former government officials are more likely to be solicited by the firm in order to exploit their political and governmental know-how and connections. Firm size, on the other hand, is positively related to GC: larger firms, as one would expect, have greater means to recruit former government officials -- and stand to benefit more from their lobbying. Additionally, government officials would be more attracted to the more 'prestigious' companies within their country.

Panel B shows the results for the control sample. As expected, non-oil & gas firms' board composition is unaffected by the economy's energy dependence. Also as expected, non-oil & gas firms' reliance on ex-government officials for their directorships is inversely related to the control of corruption measure in Model 4 (coefficient estimate = -0.054, p-value = 0.01); the result of Model 5 is similar. While the effects of control of corruption on current connectedness were shown to be significantly different for sample and control firms, when we test for difference between the coefficients of control of corruption in Model 4 of Panels A and B, the difference is insignificant (p-value=0.69). The analogous difference for Model 5 is likewise insignificant. In other words, the oil & gas industry is not unique in leveraging corruption through bringing former government officials onto the board.

Does the board's government connectedness help the firm perform better? Broadly speaking, one can expect that the government's interference via board influence is likely to undermine its performance, while a company's reliance on former government employees for its directorate can help it lobby the government on such matters as tax treatment and other legal matters. These hypotheses are tested in Tables 4 and 5.

Table 4. Effect of current government officials' board presence on company value

This table summarizes OLS regressions of sample companies' 2013 return on assets (ROA) and their effective tax rates on the proportion of current government officials on their boards together with the proportion of their equity held by the government or its agencies. Variables descriptions are contained in Appendix B. Coefficient estimates are followed by their p-values. Statistical significance at the 5 percent and 1 percent levels is market with * and **, respectively.

Dependent variable	ROA						Tax rate					
Sample	(1) Oil&Gas			(2) Controls			(3) Oil&Gas			(4) Controls		
INTERCEPT	5.906	0.00	**	6.586	0.00	**	31.623	0.00	**	24.376	0.00	**
Connectedness	-3.161	0.53		7.530	0.57		-10.866	0.48		-18.787	0.42	
Govt Ownership	6.375	0.01	*	-1.432	0.77		3.524	0.65		13.610	0.12	
Adjusted R-squared	0.041			-0.015			-0.014			0.007		
N	112			112			112			112		

In Table 4, the key explanatory variable is government connectedness through past employment. Model 1 shows that such connectedness does not impact a firm's return on assets (ROA), after controlling for the government's equity ownership percentage. The government's ownership, interestingly, is significant (p-value = 0.012). This intriguing finding suggests that, although POCs are generally thought to be better run than NOCs, among POCs, those with greater government involvement tend to do better. For control firms, on the other hand, neither variable is successful in explaining ROA, due probably to the fact that both their connectedness and government ownership levels are lower than for members of the oil & gas industry.

Models (3) and (4) report the results of explaining the effective tax rate for sample and control firms with the proportion of government employees on board and the government's ownership stake. As expected, neither variable is significant for both regressions.

Table 5. Effect of former government officials' board presence on company value

This table summarizes OLS regressions of sample companies' 2013 return on assets (ROA) and their effective tax rates on the proportion of former government officials on their boards together with the proportion of their equity held by the government or its agencies. Variables descriptions are contained in Appendix B. Coefficient estimates are followed by their p-values. Statistical significance at the 5 percent and 1 percent levels is market with * and **, respectively.

Dependent variable	ROA						Tax rate					
Sample	(1) Oil&Gas			(2) Controls			(3) Oil&Gas			(4) Controls		
INTERCEPT	4.369	0.00	**	6.381	0.00	**	27.490	0.00	**	23.365	0.00	**
Connectedness	6.897	0.07		2.156	0.66		17.479	0.14		4.803	0.58	
Govt Ownership	5.232	0.02	*	-1.139	0.82		0.298	0.97		11.916	0.17	
Adjusted R-squared	0.068			-0.016			0.002			0.003		
N	112			112			112			112		

In Table 5, we study whether the presence of former government employees on corporate boards impacts oil & gas and matching firms' ROA and tax rates. Model 1 shows weak (p-value = 0.07) evidence that government connections through prior employment indeed contribute to an oil & gas firm's profitability. For control firms, this is not the case (p-value = 0.66). However, when we test for the difference between the effect of past employment on ROA for sample and control firms, this difference is not significant (p-value = 0.44). Models 3 and 4 indicate that tax rates are not affected by past employment nor by government stakes in the firm - regardless of the firm's industry.

In short, our investigations of the determinants of company performance revealed only tentative

evidence that having former government officials on board helps make an oil & gas firm (but not other, similar, firms) profitable. More powerful tests would be needed in order to shed more light on the effect, if any, of oil firms' reliance on former government officials on their profitability. Such tests would employ larger samples and additional controls for possible country- and company-level effects. They would also disaggregate profitability into its component parts in order to identify the specific channels (if any) through which an energy company board's government experience adds value to the firm.

5. Robustness checks

Using the proportion of the number of a company's board members with government jobs on their CV as a dependent variable requires special handling due to the bounded nature of the variable. The results in Tables 2 and 3 are based on the logistic transformation of the proportion combined with ordinary least squares regression. An alternative way of dealing with this issue is to employ the fractional logistic regression of Papke and Wooldridge (1996). At the 5 percent level, all of the results involving oil dependence and corruption variables preserve their (in)significance. The only change involving the control variables for the oil & gas sample is that firm size becomes a significant predictor of the proportion of current government officials on company boards in some of the specifications. This is not surprising, as any influence over POCs would have greater impact the larger (and thus the more powerful) the POC in question.

6. Discussion and direction for future research

In essence, the analysis conducted in this project finds partial support for the posited mechanism of influence through directors on company boards. H1.A. and H1.C. are confirmed with high statistical significance, as are H2.A. and H2.D.. H1.B., H1.D., H2.A. and H2.C. are not supported (at least on a global scale – it is entirely possible that these hypotheses hold true on a national level in some countries). On the other hand, H2. B. merits further consideration: although in the models conducted in this paper the significance of the positive effect of past board connectedness on profitability did not reach the 5% threshold (and the difference with that of control firms was not significant) further refining the data and models used for this analysis to increase the power of the test could show this hypothesis to be significant at conventional levels.

If H2.B. were not supported, it could be difficult to understand why the oil & gas sector has significantly higher government connectedness than other sectors given that this connectedness provides

them with no benefit. It is conceivable that these benefits are not necessarily financial, and thus not entirely captured with the 'return on assets' measure. However, any action that benefits the company in some way is likely to lead to better economic performance, so it is not far-fetched to expect this to be reflected in the company's ROA. Alternative efficiency and profitability measures might do a better job at capturing the (potential) positive effect of board members who were previously employed by government.

The lack of support for H1.B. H1.D. and H2.C. does not necessarily invalidate the mechanism proposed in this paper - i.e. that board members who are currently employed by government influence the company in the government's favor, while board members previously employed by government influence the government in the company's favor). The most straightforward explanation for the fact that an economy's oil dependence does not impact POC-government linkages (i.e. H1.B.) is probably that when the energy sector truly matters, the government will choose to exercise its control of it through national oil & gas companies rather than by seeking board seats on private ones. Additionally, if the government does seek to influence POCs, it is likely to do so through the most powerful (i.e. large) one(s) and not bother with influencing the less important POCs. This would occur more in highly corrupt countries, where governments indeed place their officials on POC board beyond what is justified by their ownership stakes – and conversely, POCs actively recruit former government officials to join their boards.

That tax rates do not decrease with past government connectedness (H2.C.) simply means that the effect of regulatory capture on the oil & gas industry worldwide is not strong enough to have a systematic effect. More subtle effects (such as, for instance, an associated increase in return on assets) are still entirely possible.

The insignificance of H1.D. (whereby currently connected directors appear not to have significant negative impact on a company's profitability) could simply mean that current connectedness – while still a primary tool for government influence of the company – also often confers upon oil & gas firms special privileges (for instance, with respect to finding contracts and oil fields) . For instance, CNOOC (China) has recently received mandate from the Chinese government to set up an oilrig in contested waters not far off Vietnam's coast (Mullany and Barboza 2014). This is a clear case of an advancement of the interests of the Chinese government as well as a boost to CNOOC's revenue. While this may be a function of the fact that it is significantly government owned (64%), there are also examples where this is not the case. For instance, the U.N.'s Oil for Food program in Iraq, which ran from 1995 to 2010, benefitted (among others) the Russian State, NOCs,

and non-government owned oil & gas companies in Russia, such as Lukoil and Surgutneftegaz (Gardiner and Phillips 2004).

Thus, the influence of past government an official in oil & gas company boards on governments does not necessarily and exclusively benefit companies. Likewise, the influence of current government officials in oil & gas company boards on companies does not necessarily and exclusively benefit governments. However, this paper's empirical analysis does produce evidence to suggest that the influence of each type of director is on the whole more unidirectional (i.e. serving the interests of one party) than bidirectional (i.e. serving the interests of both).

It is important to note that another reason for which some of the hypotheses may elude confirmation is because there may be numerous other, more covert – and therefore less damaging in terms of reputation – ways for governments to influence POCs than by putting their officials on company boards. For instance, there is widespread outrage at the appointment of former Finance Minister, Papathanassiou (perceived by many to be responsible for the country's financial troubles of 2009) to CEO of Hellenic Petroleum – an appointment formally approved by the company's shareholders, which includes the Greek government ("Papandreou, Sahinidis Blast Government" 2014). Avoiding such outrage might be tempting, given how costly Papathanassiou's appointment was politically. For this reason, given that CEOs are the most prominent figureheads of companies, they are the most unlikely to be the channel through which governments influence companies (at least through former or current employment).

Other directors on the board are prominent within a company yet are otherwise relatively unnoticed, making them a likelier channel of 'dirty' influence. Accordingly, our results show little in the way of CEO connectedness alone, but are quite significant in some ways with respect to the connectedness of less publicized board members. Furthermore, this paper constitutes a pioneering effort at identifying informal channels of influence in public oil & gas companies through formal positions – an important step in recognizing the limitations of energy policy that tends to ignore the role that informal and/or illegal influences play in the management of Public Oil Companies.

We believe this paper is the first to look at the governance of the oil & gas sector through the prism of its government connectedness. While our findings are intriguing, much work remains to be done to pinpoint their significance. One natural extension is to distinguish between government-connected directors depending on their oil & gas industry experience. Control firms seem to exhibit no relationship between government connectedness and profitability, which could well mean that government connected directors

are as qualified for the job as non-connected directors, and only coincidentally have ties to government. Oil & gas firms, on the other hand, have a significantly higher connectedness to government through their board members, most plausibly a result of an incentive to hire them. This paper (weakly) point to one such incentive: profitability. By further coding the relevant experience and skills of directors, their suitability (or lack thereof) for a directorial position in an oil & gas firm could be better pinpointed, which could help determine whether these directors are being hired for their government connections more than for the skills they can bring to the board. Along similar lines, it may be worthwhile to code up how long ago previous employment was and its duration, as well as the duration of current employment. A director will obviously be better connected to government officials if he served as a minister for ten years than if he served as an advisor for six months. Generally coding up more specific categorical differences in public service might lead to more precise and accurate results in this type of analysis. Additionally, future research should distinguish between executive and non-executive directorships.

Another interesting direction is to extend the sample to firms in strategically important and/or especially "rent-seeking" sectors other than oil & gas, such as defense, utilities, and infrastructure. Detecting informal influence in these sectors (and others) not only foments our understanding of them, but also paves the way towards appropriate policy responses.

Conclusion

There is much anecdotal evidence on questionable linkages between private oil & gas firms and governments. Yet there has not been a systematic worldwide empirical exploration of such linkages. We seek to fill this gap by analyzing the determinants and effects of the presence of past or current government officials on the boards of 112 listed oil & gas companies from 34 countries.

We find that oil rents and other measures of an economy's dependence on the energy sector do not predict current or former government officials' membership of oil & gas company boards. However, a country's overall corruption level is positively related both to the proportion of current government officials among oil & gas company directors, and to the corresponding proportion of former government officials. Further, the effect of country-level corruption on the proportion of former government officials on company boards is significantly higher for oil & gas firms than it is for non-energy firms. Lastly, there is some (weak) evidence that former government officials on oil & gas company boards helps profitability. Taken together, our findings suggest that oil & gas directorships are occupied by

public officials in a strategic manner that merits further investigation.

Such topical issues as climate change and conflicts over natural resources have put energy at the forefront of public policy. Yet for energy policy-making to be effective, it needs to acknowledge the influence that energy firms and governments exercise over each other outside of formal channels. This paper is a first step in this direction.

Acknowledgements

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Appendix A. List of sample and control firms

Country	Oil & gas firm	Control firm
Argentina	YPF SA	Telecom Argentina SA
Australia	Aurora Oil & Gas Ltd	Mesoblast Ltd
Australia	Beach Energy Ltd	Seven West Media Ltd
Australia	Caltex Australia Ltd	Asciano Ltd
Australia	Oil Search Ltd	Aurizon Holdings Ltd
Australia	Santos Ltd	AMP Ltd
Australia	Woodside Petroleum Ltd	CSL Ltd
Austria	OMV AG	Raiffeisen Bank International AG
Brazil	Petroleo Brasileiro Petrobras SA	Itau Unibanco Holding SA
Brazil	Ultrapar Participacoes SA	CCR SA
Canada	ARC Resources Ltd	Fairfax Financial Holdings Ltd
Canada	Canadian Natural Resources Ltd	Bank of Montreal
Canada	Canadian Oil Sands Ltd	George Weston Ltd
Canada	Cenovus Energy Inc	Sun Life Financial Inc
Canada	Crescent Point Energy Corp	Alimentation Couche-Tard Inc
Canada	Encana Corporation	Magna International Inc
Canada	Husky Energy Inc	Great-West Lifeco Inc
Canada	Imperial Oil Ltd	BCE Inc
Canada	Suncor Energy Inc	Canadian National Railway Co
Canada	Talisman Energy Inc	Loblaw Companies Ltd
Chile	Antarchile SA	Banco de Credito e Inversiones
Chile	COPEC Companie de Petroleos de Chila SA	Sociedad Anonima Comercial Industrial Falabella
Chile	Quinenco SA	Aguas Andinas SA
China	Brightoil Petroleum Holdings Ltd	Beijing Jingneng Power Coi Ltd
China	China Petroleum & Chemical Corp	China Life Insurance Co Ltd
China	China Resources Gas Group Ltd	Shanghai Fosun Pharmaceutical Group Co Ltd
China	CNOOC Ltd	Ping An Insurance Group Co of China Ltd
China	Kunlun Energy Co Ltd	Anhui Conch Cement Co Ltd
China	PetroChina Co Ltd	Industrial and Commercial Bank of China Ltd
China	Sinopec Shanghai Petrochemical Co Ltd	Everbright Securities Co Ltd
China	Towngas China Co Ltd	Guangshen Railway Co Ltd
Colombia	Ecopetrol SA	Bancolombia SA
Finland	Neste Oil Corporation	Nokian Tyres PLC
France	Bourbon SA	Virbac SA
France	Etablissements Maurel et Prom SA	Societe Industrielle et Financiere de l'artois SA
France	Rubis SCA	Societe Fonciere Lyonnaise SA
France	Total SA	Sanofi SA
Greece	Hellenic Petroleum SA	Public Power Corporation SA
Hungary	MOL Magyar-Olaj-es Gazipari Nyrt	Richter Gedeon Vegyeszeti Gyar Nyrt PLC
India	Cairn India Ltd	NMDC Ltd
India	Castrol India Ltd	Aurobindo Pharma Ltd
India	Indian Oil Corpn Ltd	Bajaj Auto Ltd
India	Oil and Natural Gas Corporation Ltd	Infosys Ltd
India	Oil India Ltd	Steel Authority of India Ltd
India	Reliance Industries Ltd	ITC Ltd
Ireland	DCC PLC	Glanbia PLC
Israel	Avner Oil Exploration LP	Mizrahi Tefahot Bank Ltd
Israel	Delek Energy Systems Ltd	Bezeq Israeli Telecommunication Corp Ltd
Italy	Eni SpA	Intesa Sanpaolo SpA
Italy	ERG SpA	Ansaldo STS SPA
Italy	Saipem SpA	Exor SpA
Japan	Cosmo Oil Co Ltd	SKY Perfect JSAT Holdings Inc
Japan	Idemitsu Kosan Co Ltd	Konami Corp
Japan	Inpex Corp	Sony Corp
Japan	Japan Petroleum Exploration Co Ltd	Pola Orbis Holdings Inc
Japan	JX Holdings Inc	Daiichi Sankyo Co Ltd
Japan	Marubeni Corp	Daiwa House Industry Co Ltd
Japan	Showa Shell Sekiyu KK	Hamamatsu Photonics KK
Japan	Sojitz Corp	Advantest Corp
Japan	Sumitomo Corp	MS&AD Insurance Group Holdings Inc
Japan	TonenGeneral Sekiyu KK	Acom Co Ltd
Malaysia	Petronas Dagangan Bhd	IHH Healthcare Bhd

Malaysia	Sapurakencana Petroleum Bhd	Hong Leong Bank Berhad
Netherlands	Royal Dutch Shell PLC	Unilever NV
Norway	Dno International ASA	Storebrand ASA
Norway	Statoil ASA	Telenor ASA
Pakistan	Oil & gas Development Co Ltd	MCB Bank Ltd
Pakistan	Pakistan Petroleum Ltd	Habib Bank Ltd
Phillipines	Petron Corp	GT Capital Holdings Inc
Phillipines	San Miguel Corp	Jollibee Foods Corp
Poland	Polski Koncern Naftowy Orlen SA	ING Bank Slaski SA
Poland	Polskie Gornictwo Naftowe i Gazownictwo SA	mBank SA
Portugal	Galp Energia SGPS SA	Jeronimo Martins SGPS SA
Romania	OMV Petrom SA	Fondul Proprietatea SA
Russia	ANK Bashneft' OAO	AFK Sistema OAO
Russia	Gazprom neft' OAO	Uralkaliy OAO
Russia	Gazprom OAO	Sberbank Rossii OAO
Russia	NK Lukoil OAO	Magnit OAO
Russia	Novatek OAO	MegaFon OAO
Russia	Slavneft'-Megionneftegaz OAO	Aeroflot OAO
Russia	Surgutneftegaz OAO	VTB Bank OAO
Russia	Tatneft' OAO	Novolipetsk Steel OJSC
South Korea	Hanwha Corp	Daewoo Securities Co Ltd
South Korea	SK Innovation Co Ltd	Samsung Fire & Marine Insurance Co Ltd
South Korea	S-Oil Corp	KT Corp
Spain	Repsol SA	Endesa SA
Sweden	Lundin Petroleum AB	Melker Schorling AB
Thailand	IRPC PCL	Ratchaburi Electricity Generating Holding PCL
Thailand	PTT Exploration and Production PCL	Siam Cement PCL
Thailand	PTT PCL	Advanced Info Service PCL
Thailand	Thai Oil PCL	True Corporation PCL
Turkey	Koc Holding AS	Turk Telekomunikasyon AS
UAE	Dragon Oil PLC	National Bank of Abu Dhabi
UK	Afren PLC	FirstGroup PLC
UK	BG Group PLC	Reckitt Benckiser Group PLC
UK	BP PLC	GlaxoSmithKline PLC
UK	Genel Energy PLC	Spectris PLC
UK	Gulf Keystone Petroleum Ltd	TCS Group Holding PLC
UK	Indus Gas Ltd	Beazley PLC
UK	Ophir Energy PLC	Intermediate Capital Group PLC
UK	Premier Oil PLC	Home Retail Group PLC
UK	Tullow Oil PLC	Marks and Spencer Group PLC
US	Anadarko Petroleum Corp	McKesson Corp
US	Apache Corp	Covidien PLC
US	Chevron Corp	Procter & Gamble
US	ConocoPhillips	Twenty-First Century Fox Inc
US	EOG Resources Inc	FedEx Corp
US	Hess Corp	Estee Lauder Companies Inc
US	Occidental PetroleumCorp	Altria Group Inc
US	Phillips 66	Kimberly-Clark Corp
US	Valero Energy Corp	CME Group Inc
US	Williams Companies Inc	CSX Corp

Appendix B. Variable descriptions

Variable	Description
Company-level variables (sample and control firms)	
Connectedness variables	
Current board connectedness	The proportion of all board members on the board of directors who are currently on government payroll. (calculated from BoardEx data)
Past board connectedness	The proportion of all board members on the board of directors who were previously on government payroll. (calculated from BoardEx data)
Financial variables	
Government ownership	The proportion of the company's shares owned by government and its institutions.
Effective tax rate	Ratio of income taxes paid to pretax income.
Return on assets	Net income divided by total assets.
Logarithm of market cap	Logarithm of the market capitalization (in GBP) of the company as of the beginning of February 2014.
Country-level variables	
Oil rent % GDP	Difference between the value of crude oil production at world prices and total costs of production as percentage of GDP. (World Bank 2012)
Fuel % merchandise exports	Proportion of merchandise exports made up by fuel. (World Bank 2012)
Fuel % merchandise imports	Proportion of merchandise imports made up by fuel. (World Bank 2012)
Control of corruption	Composite indicator of the degree to which corruption is kept under control in a state. (World Governance Indicators, World Bank 2013)

Appendix C. Summary of hypotheses
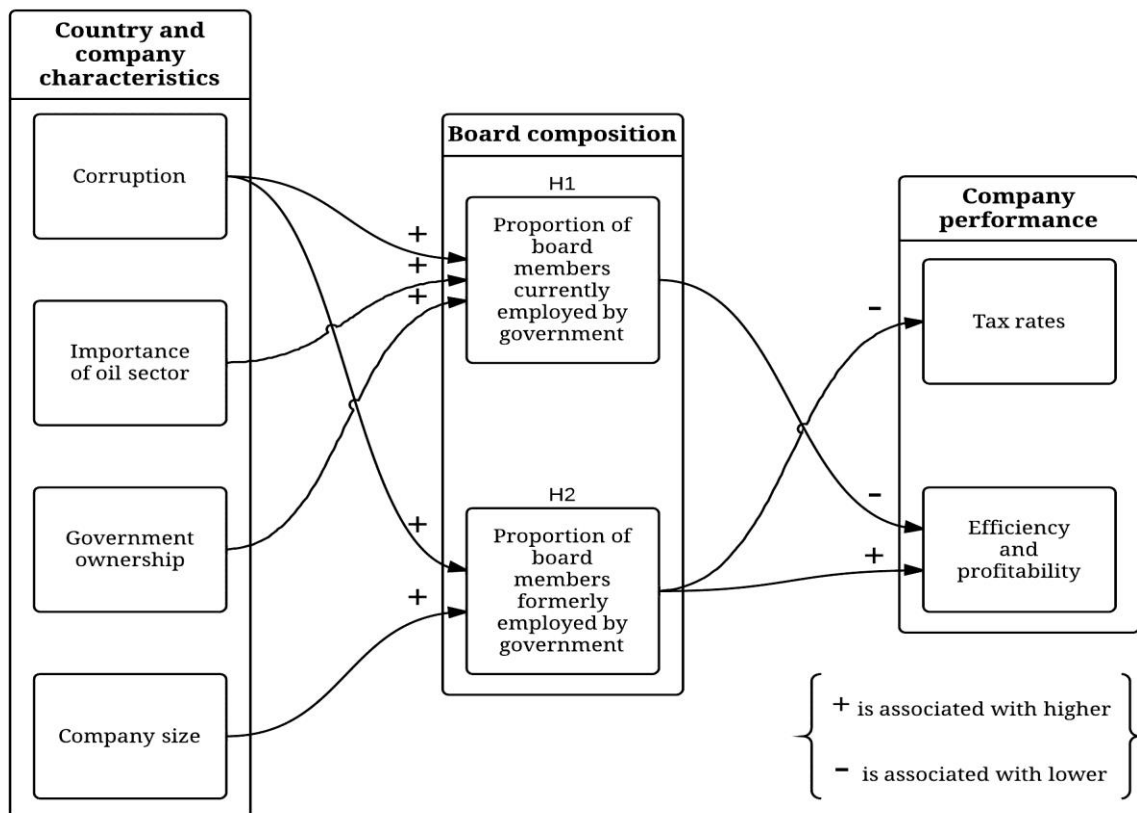
Appendix D. Expected interaction of variables according to hypotheses

This table presents a summary of the expected relationship between current and past government connectedness and the most likely variables affected by (or affecting) this connectedness according to the mechanism posited in this paper. Positive relationships are noted with a +, while negative relationships are noted with a -. Where no relationship is expected, no symbol is used.

Dependent measures	Concept measured	Connectedness	
		Current	Past
Company-level measures			
Financial measures			
Government ownership	Formal control of government	+	
Effective tax rate	Regulatory capture		-
Return on assets		-	+
	Profitability and efficiency		
Logarithm of market cap	Company size		+
Country-level measures			
Oil rent % GDP	Importance of oil sector	+	
Fuel % merchandise exports	Importance of oil sector	+	
Fuel % merchandise imports	Importance of oil sector	+	
Control of corruption	Mitigation of informal influence	-	-